Electronic Services - Hayward, Ca
M17892X

Multi-Sweep 121-C
Multi-Sweep 121-CFA

OP

KAY ELECTRIC CO.

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OPERATOR'S MANUAL
ISSUE A

OCTOBER 1965

MULTI-SWEEP 121-C

MULTI-SWEEP 121-CFA

KAY ELECTRIC COMPANY
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SECTION I
PRELIMINARY INFORMATION

1-1 INTRODUCTION

The MULTI-SWEEP 121-C and 121-CFA are solid-state, sweeping oscillators which accept a variety of RF plug-in type heads to cover a wide range of swept frequencies. Typical coverage is 500 KC-1050 MC, 900-1300 MC, or any predetermined swept octave in the range of 100 to 1000 MC, depending on the head in use. Variable center frequency and sweep width controls permit operation of the MULTI-SWEEP over any portion of these frequency ranges.

The sweep voltages generated have sawtooth waveshapes and no phasing adjustments are necessary. Blanking of the RF output during CRO retrace time provides a zero-voltage reference. External signals such as a sine wave or triangular wave, at frequencies between 1 CPS and 20 KC, may be used to externally modulate the swept oscillator, and drive the X-axis amplifiers of the CRO.

The swept output is AGC'd and metered and a built-in Attenuator permits insertion of precise 10 DB steps of attenuation ahead of the output jack. A precise 1 DB step attenuator is also provided with the 121-CFA and optional with the 121-C units. A direct reading 0-300 MC digital frequency dial provides a center frequency control at VHF and a vernier control at UHF. A built-in Detector is provided for added convenience. An external, high-impedance, feed-thru type detector is provided with 121-CFA units.

Fixed frequency harmonic markers may be obtained when optional circuitry is included. (Markers of 1, 10, and 100 MC are standard). A variable Birdie Pip Marker can be developed using an external CW generator. All markers are available at the VERT OUT jack on the front panel. A front panel marker amplitude control is also provided.

1-2 INSTALLATION

Unpacking: As soon as the 121-C or 121-CFA is received, it should be visually inspected to determine that the instrument was not damaged during shipment. Any damage or shortage should be reported immediately to the carrier and to Kay Electric Company.

Operating Notes: These instruments are designed for general use in an environment reasonably constant in temperature and humidity. The ventalation grating will provide adequate air circulation for normal bench top operation if it is left unobstructed. In any test operation using the 121-C or 121-CFA impedance matching networks should be used where the input and output impedances of the apparatus differ substantially. Also, the exclusive use of coaxial connectors and cables of the proper impedance and minimum length will eliminate any stray pick-up. These few precautions will insure optimum performance and stability from the Multi-Sweep. Information concerning the interconnection of equipment is covered in Section III of this manual.

1-3 SPECIFICATIONS

SPECIFICATION	121-C	121-CFA
Output	0.5 Volts RMS, into 50 ohms	+6DBM, into 50 ohms
Output Impedance	50 ohms	50 ohms
Harmonic Distortion	More than 30 DB down	More than 26 DB down
Spurious Oscillation	More than 30 DB down	More than 26 DB down
Sweep Rates	Locks to Line Frequency. Variable between 10 and 60 CPS. External Modulation: DC - 20 KC.	
Attenuators	Steps of 0, 10, 20, 30, 40, 50, and 60 DB provided.	
	Steps of 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 DB available.	Steps of 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 DB provided.
Markers	Inputs provided for development of variable birdie markers.	
	Fixed harmonic markers at multiples of 1, 10, and 100 MC available.	Fixed harmonic markers at multiples of 1, 10, and 100 MC. Single frequency markers at 62.1, 63.0 and 63.9 MC.
Marker Accuracy	±0.005%	±0.002%
Power Input	117V (±10%). 50-60 CPS, 60W, (230V with wiring change).	
Dimensions	19-3/8 x 10-7/8 x 16-1/8	
Weight	42 lbs.	
P121 Head (VHF)		
Frequency Range Sweep Width Flatness	500 KC to 300 MC 50 KC to 300 MC ±0.25 DB	NOT USED
P121 Head (UHF)		
Frequency Range Sweep Width Flatness	200 to 1050 MC 35 KC to 350 MC ±0.25 DB (200-800MC) ±0.5 DB (800-1050MC)	200 to 1050 MC 35 KC to 350 MC ±0.75 DB

P122-FA Head (VHF)		
Frequency Range Sweep Width Flatness	NOT USED	1 to 300 MC 200 KC to 300 MC ±0.5 DB
P122 Head (UHF)		
Frequency Range Sweep Width Flatness	900 to 1300 MC 200 KC to 400 MC ±0.5 DB	900 to 1300 MC 200 KC to 400 MC ±1.0 DB
P123 Head		
Frequency Range	Predetermined swept octave between 100 and 1000 MC.	NOT USED
Sweep Width Flatness	Dependent on Frequency Range ±0.5 DB	NOT USED

OPERATING CONTROLS 121-C

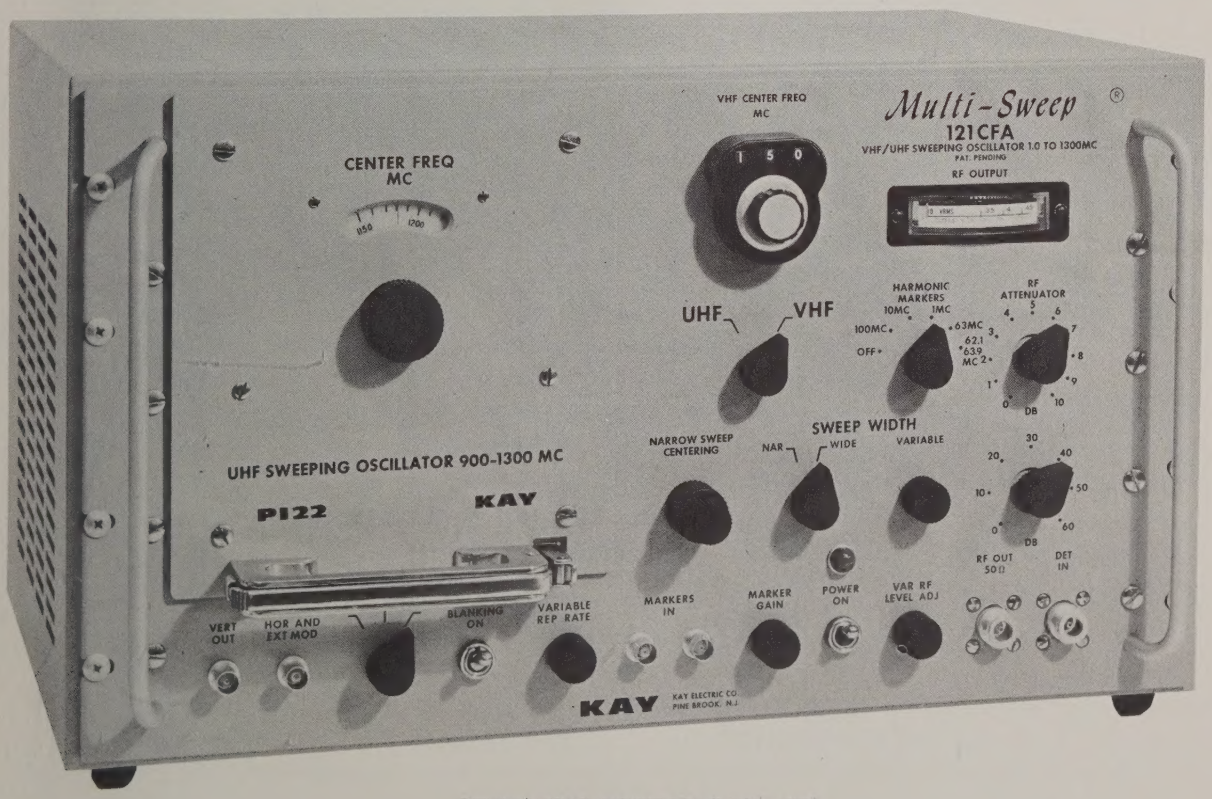
SECTION II

OPERATING CONTROLS AND TERMINALS

CONTROL	POSITION	FUNCTION
POWER switch	ON	Line voltage is applied to the power transformer. Pilot light is on.
	OFF	Instrument is completely de-energized.
Function Selector ·	LINE LOCK	The repetition rate of the sawtooth is locked to the line frequency.
	VAR	Permits use of the Variable REP RATE control to provide sweep rates between 10 and 60 CPS.
	EXT MOD	An external signal from DC to 20 KC may be used to modulate the sweep oscillator output.
VARIABLE REP RATE control	Variable	Sweep rate may be varied from 10 to 60 CPS when the function selector is set to the VAR position.
BLANKING ON switch	ON	The swept RF output is blanked during CRO retrace time, providing a zero-voltage baseline.
UHF-VHF switch	UHF	Used to select mode of operation.
	(with 121-CFA)	Band #2 - Provides swept output of 900 to 1300 MC. (w/P122-FA head).
		Band #3 - (auxilliary) Provides range of 200 to 1050 MC. (w/P121-A head).
	(with 121-C)	Provides frequency range of 200 to 1050 MC with P121-A head.
		Provides frequency range of 900 to 1300 MC with P122-A head.
		Provides range of predetermined swept octave between 100-1000 MC w/P123-A head.
	VHF (with 121-CFA)	Band #1 - Provides range of 1 to 300 MC with P122-FA head. Not used with P121-A head.
	(with 121-C)	Provides range of 500KC to 300MC using P121-A head. Not used with P122-A or P123-A heads.

UHF CENTER FREQUENCY	Variable	(Located on plug-in-head) Used to select center frequency of swept RF output when UHF-VHF switch is placed in UHF position.
VHF CENTER FREQUENCY	Digital Readout	Selects the center frequency of the swept RF output when the UHF-VHF switch is set to VHF.
SWEEP WIDTH switch	NAR-WIDE	Determines the range of the SWEEP WIDTH control.
SWEEP WIDTH control	Variable	Sweep width can be varied within the range selected by the SWEEP WIDTH switch.
VAR RF LEVEL ADJ control	Variable	Used to vary the amplitude of the swept RF output over a 3 DB range. (1.5 DB - 121-CFA).
MARKER GAIN control	Variable	Used to vary the amplitude of the birdie markers.
HARMONIC MARKERS switch	-------	According to the setting of this switch fixed markers at multiples of 1, 10, and 100 MC may be generated. (Markers at frequencies of 63.0, 63.9 and 62.1 MC may also be selected with 121-CFA units).
RF ATTENUATOR	Stepped	Precise steps of attenuation in 0, 10, 20, 30, 40, 50, 60 DB increments can be inserted by this control.
RF ATTENUATOR	Stepped	Steps of 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 DB are provided with the 121-CFA and optional with the 121-C.
NARROW SWEEP CENTERING	Variable	Used when the SWEEP WIDTH switch is in NARROW, to adjust the frequency of the sweeping oscillator.

TERMINAL	FUNCTION
RF OUTPUT 50 OHMS	This is the 50 ohm terminal for the swept RF output.
DET IN	The detector may be used for a self-check of the Multi-Sweep and may be used during operation if the output impedance of the device under test is compatible.
VERT OUT	The detected signal plug markers, if desired, are available at this terminal. May be directly connected to the Y-axis of the CRO.
MARKERS IN	The output from an external CW generator(s) may be connected to this terminal to produce a variable marker(s).
HOR AND EXT MOD	Provides a sawtooth output normally used to drive the X-axis amplifiers of the CRO. The repetition rate is determined by the setting of the LINE LOCK-VAR-EXT MOD function selector.



OPERATING CONTROLS 121-CFA

SECTION III
OPERATING INSTRUCTIONS

3-1 INTRODUCTION

This section covers the operation of the Multi-Sweep 121-C and 121-CFA as sweeping oscillators. The operation of the internal, harmonic markers, which are optional with the 121-C units, are also included in this section.

3-2 VARIABLE REPETITION RATES

A repetition rate, variable between 10 and 60 CPS may be obtained by setting the Function Selector switch to the VAR position. The VARIABLE REP RATE control is then used to select the desired sweep rate. Rate selected should be fast enough to retain as much of the pattern as possible on the CRO screen, while still maintaining the correct response curve.

The VARIABLE REP RATE is useful when observing the response of circuits having sharp variations in amplitude. In such cases, the slower rep rates will disclose sharp variations which faster rep rates may not 'see'. Another advantage of the variable rates becomes apparent when a circuit exhibits 60-cycle hum. If such a circuit is swept at a 60 CPS rate, or one of its harmonics, the response curve is distorted. If the rate is changed to other than 60 CPS, the response curve will exhibit oscillation indicating hum.

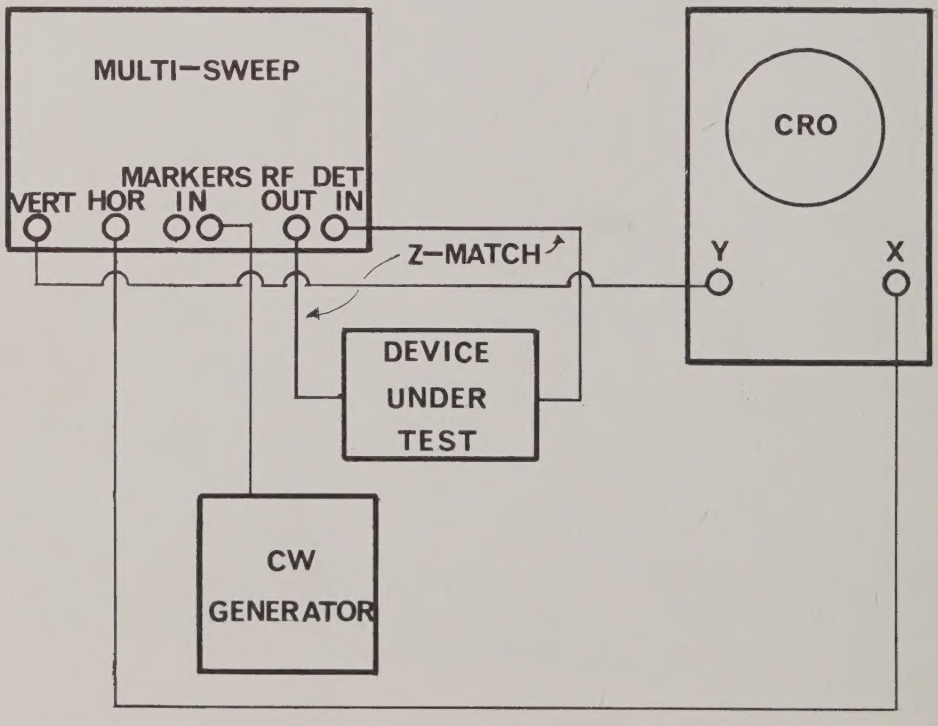


FIGURE 3-1

3-3 EXTERNAL MODULATION

Repetition rates from DC to 20 KC may be obtained by using an external signal generator to supply the sweep signal. The Function Selector must be placed in the EXT MOD position, and the output of the signal generator connected to the HOR AND EXT MOD terminal. This same signal is connected to the X-axis terminal of the oscilloscope as shown in Fig. 3-2. A signal of approximately 8 volts, peak-to-peak, is required to obtain maximum sweep width.

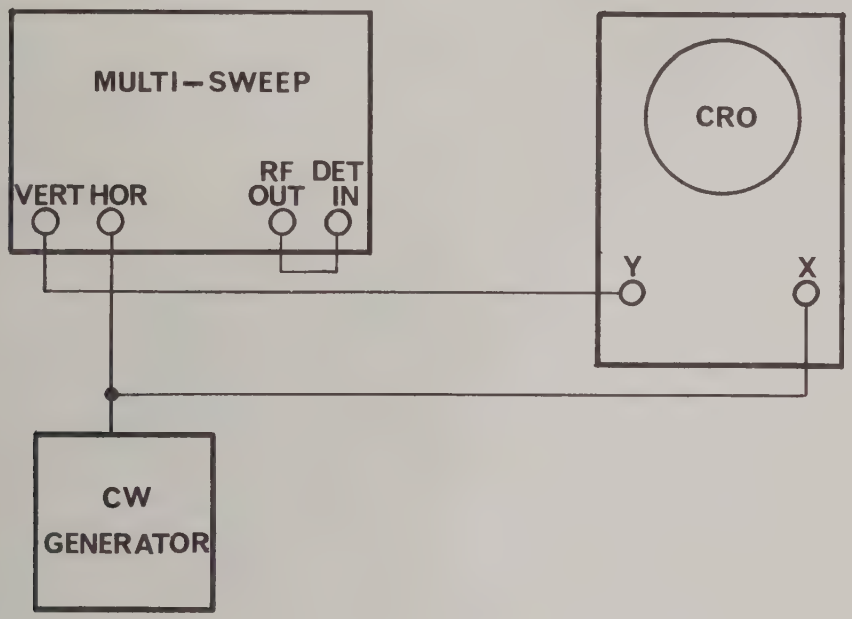


FIGURE 3-2

3-4 BLANKING

Placing the BLANKING switch in the ON position with the Function Selector in either LINE LOCK or VAR, blanks out the RF output during the retrace time. During this period a zero-voltage reference baseline is displayed on the scope screen, enabling amplitude measurements to be made directly on the display.

3-5 UHF OPERATION

Interconnect the 121-C or 121-CFA and associated equipment as in Fig. 3-1.

Set the UHF-VHF switch to the UHF position and the digital VHF CENTER FREQUENCY control to 150 MC. (VHF CENTER FREQUENCY acts as a vernier control. With the dial set to 150 MC, the UHF dial may be read directly). Set the UHF CENTER FREQUENCY control to the desired center frequency. Set the Function Selector to LINE LOCK to lock the trace at 60 CPS.

If the variable rep rates or external modulation is used, follow the instructions in paragraphs 3-2 or 3-3.

Set the VAR RF LEVEL ADJ control and RF ATTENUATOR(S) to provide vertical deflection within input amplitude requirements of the device under test, and for easy viewing on the CRO screen.

Sweep width adjustments should be set to display the desired portion of the response curve, consistent with information sought. Controls are normally set to provide sweep width two or three times the passband of the device under test. (Instructions for narrow sweep operation are furnished in paragraph 3-7).

3-6 VHF OPERATION

Operation in the VHF mode is similar to that of UHF.

Set the UHF-VHF switch to VHF and the UHF CENTER FREQUENCY control to VHF SET (121-C only). Set the VHF CENTER FREQUENCY control to the desired sweep center frequency.

NOTES:

121-C Units - When P-122 or P-123 sweep oscillator plug-in-units are in use, the UHF-VHF switch must be set to UHF.

121-CFA Units - When the Aux. Band is in use, the UHF-VHF switch must be set to UHF.

3-7 NARROW SWEEP WIDTH OPERATION

The narrow sweeps provide optimum stability over their range. With the SWEEP WIDTH switch in the WIDE position, set the UHF-VHF CENTER FREQUENCY controls to provide the desired output frequency. Place the SWEEP WIDTH switch in the NAR position, SWEEP WIDTH control fully clockwise, and rotate the NARROW SWEEP CENTERING control until the output is again at the desired frequency. Adjust SWEEP WIDTH control for desired display.

3-8 INTERNAL DETECTOR

For convenience, an internal detector has been provided in these instruments. Normally, this feature is used for a self-check of the operating characteristics of the sweep generator. However, when the output impedance of the device being examined matches the input impedance of the detector, or when a matching circuit can be used to provide the proper impedance, the output of the device may be detected within the sweep generator. When the internal detector is used in this manner, the input is fed into the DET IN jack, and the detected output, with the markers, if any, riding on the detected envelope, is available at the VERT OUT jack.

3-9 EXTERNAL DETECTOR (121-CFA Units)

A feed-thru type external detector has been provided for use with the Multi-Sweep 121-CFA units. This detector may be used as shown in Fig. 3-3 with minimum circuit disturbance. When connected as shown, birdie markers may be superimposed on the output of the detector, if desired.

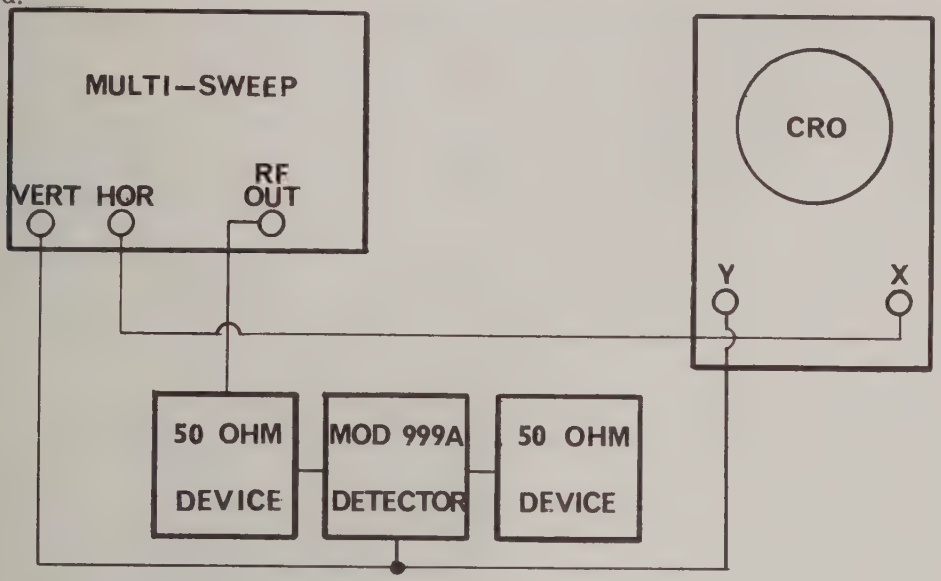


FIGURE 3-3

3-10 EXTERNAL MARKERS

One or two variable markers can be developed using a CW generator(s) and will be available at the VERT OUT jack. A variable marker is developed by applying the output from the CW generator to one of the MARKERS IN jacks. Marker frequency corresponds to the output frequency of the CW generator, and, depending on the frequency range of the external generator, the marker may be moved over the entire swept range of the Multi-Sweep. This type of marker is referred to as a birdie marker, and is superimposed on the detected output. Marker amplitude is adjustable with the MARKER GAIN control.

NOTE: A single birdie type marker will be produced if the amplitude of the CW input to the Multi-Sweep is suitably low; high input amplitudes will produce harmonically related markers which will also appear on the trace (if swept frequency and width are compatible).

3.11 FIXED-FREQUENCY INTERNAL MARKERS (121-CFA Units)

Fixed frequency markers at multiples of 1, 10, and 100 MC and fundamental frequency markers at 62.1, 63.0, and 63.9 MC may be selected with the HARMONIC MARKERS switch. (The extreme clockwise position of this switch selects both the 62.1 and the 63.9 MC markers). These markers are available at the VERT OUT jack in the familiar picket-fence configuration. If desired, both the fixed markers and one or two variable markers may be used simultaneously.

NOTE: Fixed-frequency internal markers are available with the Multi-Sweep 121-C units at multiples of 1, 10, and 100 MC.

SECTION IV
CHECK-OUT PROCEDURE

4-1 APPLICATIONS

The information contained in this section can enable the operator of the 121-C or 121-CFA to perform a general, overall check of his instrument. If desired, these check-outs can be applied whenever:

a) The unit is initially received.
b) The unit undergoes preventative maintenance.
c) Any components have been replaced.

For actual alignment procedure and troubleshooting information, you can refer to the Maintenance Manual on these instruments.

4-2 CHECK-OUT PROCEDURE, 121-C and 121-CFA

Equipment Required:

Oscilloscope, Tektronix Mod. 503 or equiv.

Microwave Power Meter, Hewlett-Packard Mod. 430C, using Mod. 477 Thermistor Mount or equiv.

CW Oscillators covering the range of the Multi-Sweep

Coaxial patch cords with the proper impedance and connectors.

Absorbtion-Type Wavetraps - 35 KC and 50 KC.

Tuned Detectors, 75, 100, 300 MC (See Text).

A. Sweep Circuits

1. Connect the HOR AND EXT MOD jack to the vertical input terminals of the scope. Set the scope to internal sweep.

2. Set the Function Selector switch to the VAR position and see that the VARIABLE REP RATE control changes the frequency from 10 to 60 CPS. See that the output is constant over this range and the amplitude is 8 volts peak-to-peak.

3. Set the Function Selector to LINE LOCK and see that the sawtooth signal is locked at line frequency and the amplitude is equal to that measured in Step 2.

B. Sweep Ranges - 121-C Units

Interconnect equipment as in Fig. 4-1.

1. P-121 Head, VHF Mode (500 KC - 300 MC)

Preliminary Setting:

UHF-VHF switch - VHF
UHF CENTER FREQUENCY control - VHF SET
SWEEP WIDTH switch - WIDE
SWEEP WIDTH control - Set for approx. 3 MC width
Function Selector - LINE LOCK
BLANKING switch - ON
MARKER GAIN control - fully clockwise
RF ATTENUATORS - 0 DB
VAR RF LEVEL ADJ - fully clockwise

a. Center the trace on the scope. Output of the Detector should be approximately 0.4 volts.

b. Set the VHF CENTER FREQUENCY control to zero and see that a zero beat appears on the screen.

c. Set the CW Oscillator for 500 KC and a convenient output, and see that the birdie marker appears on the right-hand side of the zero beat.

d. Set the VHF CENTER FREQUENCY control and the external oscillator to 300 MC. See that the birdie marker appears near the center of the CRO screen.

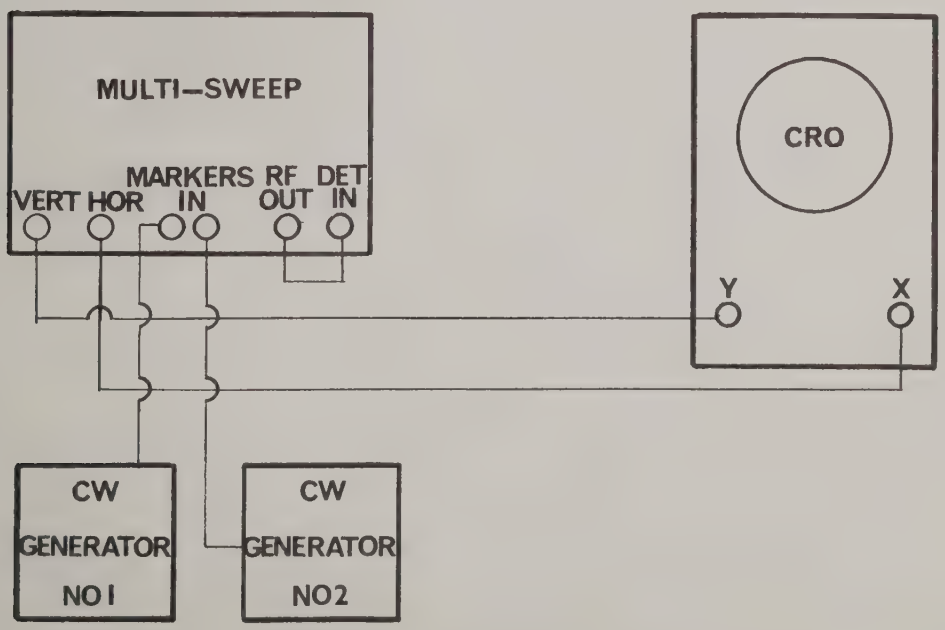


FIGURE 4-1

e. Set the SWEEP WIDTH control to its fully clockwise position and the VHF CENTER FREQUENCY control to 150 MC. See that the zero beat falls on the left and the birdie marker on the right-hand side of the trace.

2. P-121 Head, UHF Mode (200 - 1050 MC)

Preliminary Settings:

Set controls as in Step (1) above except:

UHF-VHF switch - UHF
UHF CENTER FREQUENCY control - 200 MC
VHF CENTER FREQUENCY control - 150 MC
SWEEP WIDTH control - fully clockwise

a. Set the CW Oscillator to 200 MC and see that the birdie marker appears approximately in the center of the CRO screen.

b. Set the CW Oscillator to 1050 MC and the UHF CENTER FREQUENCY control until the birdie marker appears on the right-hand side of the trace.

c. Set the CW Oscillator to 700 MC. The marker should appear near the left-hand side of the detected envelope.

3. P-122 Head, UHF Mode only (900 - 1300 MC)

Preliminary Settings:

UHF-VHF switch - UHF
SWEEP WIDTH switch - WIDE
SWEEP WIDTH control - fully clockwise
UHF CENTER FREQUENCY control - 1100 MC
Function Selector - LINE LOCK
BLANKING - ON
MARKER GAIN - fully clockwise
RF ATTENUATOR(S) - 0 DB
VAR RF LEVEL ADJ - fully clockwise

a. Center the trace on the scope.

b. Set the CW Oscillator to 900 MC and see that the marker appears on the left-hand side of the trace.

c. Reset the external oscillator to 1300 MC; the marker should appear on the right-hand side of the scope.

d. With the oscillator set at 1100 MC, the birdie marker should be centered on the trace.

4. P-123 Head, UHF Mode only (Predetermined swept octave between 100 and 1000 MC)

Preliminary Settings:

UHF-VHF switch - UHF
SWEEP WIDTH switch - WIDE
SWEEP WIDTH control - fully clockwise
Function Selector - LINE LOCK
BLANKING - ON
MARKER GAIN - fully clockwise
RF ATTENUATOR(S) - 0 DB
VAR RF LEVEL ADJ - fully clockwise

NOTE: For an example, the swept octave will be from 300 - 600 MC.

a. Center the trace on the scope.

b. Set the UHF CENTER FREQUENCY control to 450 MC and the CW Oscillator to 300 MC. The marker should appear on the left-hand side of the envelope.

c. Set the external oscillator to 450 MC; the marker should be centered on the sweep.

d. Set the external oscillator to 600 MC; see that the marker is located on the right-hand side of the trace.

C. Sweep Ranges - 121-CFA Units

Interconnect equipment as in Fig. 4-1.

1. P-122FA Heads, VHF Mode (Band #1, 1-300 MC)

Preliminary Settings:

UHF-VHF switch - VHF
VHF CENTER FREQUENCY control - 000
SWEEP WIDTH switch - WIDE
SWEEP WIDTH control - set for approx. 5 MC width
Function Selector - LINE LOCK
BLANKING - ON
MARKER GAIN control - fully clockwise
RF ATTENUATORS - 0 DB
VAR RF LEVEL ADJ - fully clockwise

a. Center the trace on the scope.

b. The zero beat should be centered on the trace.

c. Set the CW Oscillator to 1 MC; the birdie marker should appear on the right-hand side of the zero beat. Set the SWEEP WIDTH control fully CW.

d. Set the VHF CENTER FREQUENCY control and the external oscillator to 300 MC; see that the birdie marker is centered on the detected envelope.

e. Set the VHF CENTER FREQUENCY control to 150 MC and see that the marker appears on the right-hand portion and the zero beat on the left-hand portion of the trace.

2. P-122FA Head, UHF Mode (900 - 1300 MC)

Preliminary Settings:

Set controls as in Step (1) above except:

UHF-VHF switch - UHF

a. Center the trace on the scope.

b. Set the UHF CENTER FREQUENCY control and the external oscillator to 900 MC; the marker should be approximately centered on the scope trace.

c. Set the UHF CENTER FREQUENCY control and the external oscillator to 1300 MC; the birdie marker should be centered on the detected envelope.

d. Set the SWEEP WIDTH control fully clockwise and the UHF CENTER FREQUENCY control to 1100 MC; the birdie marker should appear on the right-hand side of the trace.

e. Set the CW Oscillator to 900 MC; check to see that the marker falls on the left-hand side of the trace.

3. P-121 Head, UHF Mode only (Aux. Band 200 - 1050 MC)

Preliminary Settings:

Set controls as in Step (1) above except:

UHF-VHF switch - UHF
UHF CENTER FREQUENCY control - 200 MC
VHF CENTER FREQUENCY control - 150 MC
SWEEP WIDTH control - fully clockwise

a. Center the trace on the scope.

b. Set the CW Oscillator to 200 MC and see that the marker appears approximately in the center of the screen.

c. Set the CW Oscillator to 1050 MC and the UHF CENTER FREQUENCY control until the birdie marker appears on the right-hand side of the trace.

d. Set the CW oscillator to 700 MC; the marker should appear near the left-hand side of the detected envelope.

D. Narrow Sweep Checks

1. Interconnect equipment as shown in Fig. 4-2 and set controls as in Step B or C above. Set the SWEEP WIDTH switch to NAR.

2. Set the CENTER FREQUENCY control and CW Generator #1 to the center frequency of the band in use. Center the marker on the trace using the NARROW SWEEP CENTERING control.

3. To check 200 KC widths, set CW Generator #2 to 100 KC and see that the birdie markers appear as shown in Fig. 4-3A.

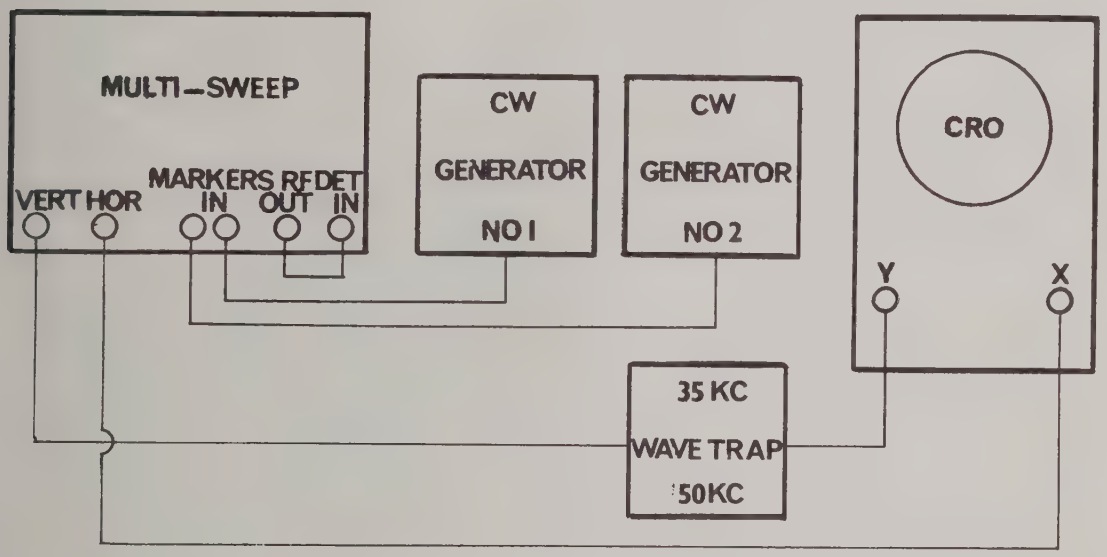


FIGURE 4-2

4. To check sweep widths less than 100 KC, switch in the appropriate wave trap and center the birdie on the extreme left-hand side of the trace. The suckout should be visible on the right-hand side of the trace. Refer to Fig. 4-3B.

MULTI-SWEEP	FREQ. RANGE	SWEEP WIDTH	WAVE TRAP OR MARKER FREQ.
121-C	500KC-300MC	50KC	50KC TRAP
	200-1050MC	35KC	35KC TRAP
	900-1300MC	200KC	100KC BIRDIE
121-CFA	BAND #1	200KC	100KC BIRDIE
	BAND #2	200KC	100KC BIRDIE
	AUX. BAND	35KC	35KC TRAP

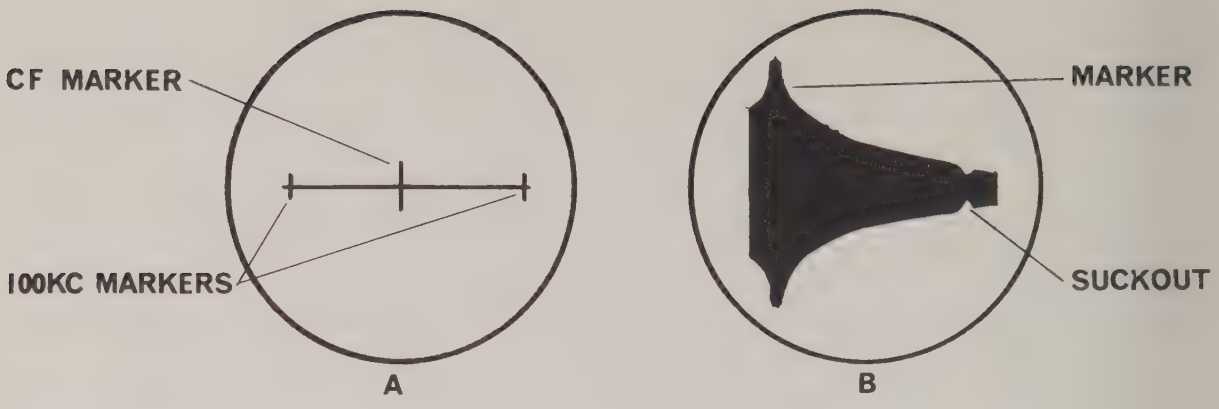


FIGURE 4-3

E. RF Output, Flatness, and Meter Circuits

Preliminary Settings:

Set controls as in Step (C1) above except:
SWEEP WIDTH switch - WIDE
SWEEP WIDTH control - fully counter-clockwise
UHF CENTER FREQUENCY - settings dependent on plug-in head and
VHF CENTER FREQUENCY - band in use see Steps B and C above.
BLANKING - OFF

1. Connect Bolometer to RF OUT 50Ω jack.

2. 121-C units - Bolometer should indicate an output of 0.5 Volts RMS, minimum.

3. 121-CFA units - Bolometer should indicate an output of +6 DBM.

4. Check to see that the Multi-Sweep meter agrees with the readings taken in step 2 or 3.

5. Vary the UHF or VHF CENTER FREQUENCY control (depending on band in use) between its upper and lower limits. Output should be within the tolerances listed in the table below.

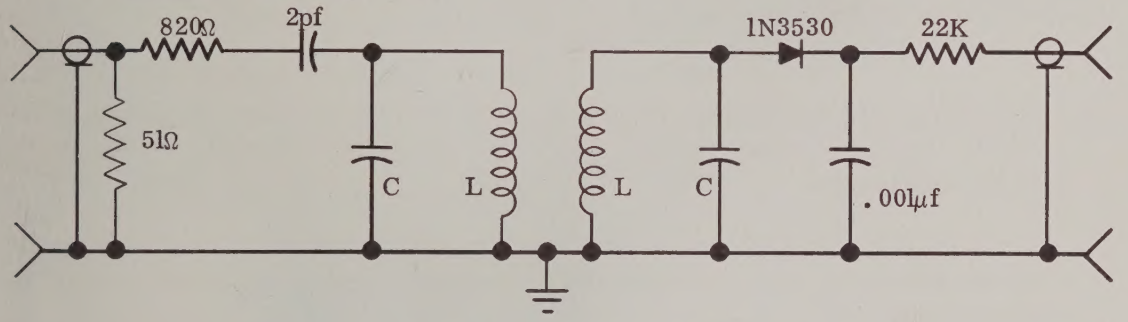
121-C UNITS	TOLERANCE
500KC-300MC	±0.25 DB
200-800MC	±0.25 DB
800-1050MC	±0.5 DB
900-1300MC	±0.5 DB
P-123 Head	±0.5 DB
121-CFA UNITS	TOLERANCE
Band #1	±0.5 DB
Band #2	±1.0 DB
Aux. Band	±0.75 DB

6. Rotate the variable RF LEVEL control to its fully CW position. See that the output decreases approximately 3 DB (1.5 DB 121-CFA units).

F. Distortion Checks

1. Set the Function Selector to LINE LOCK, and the RF LEVEL control fully clockwise.

2. Connect the RF output to a 0-40 DB Attenuator, whose output is fed to a 75MC tuned detector. (See Fig. 4-4).



L & C selected for resonant frequency of the tuned detector.

FIGURE 4-4. TUNED DETECTOR

3. Connect the output of the Detector to the vertical input of the oscilloscope. A display, similar to that of Fig. 4-5, should be obtained.

4. Switch in attenuation until the fundamental frequency is reduced to the amplitude of the second harmonic.

5. The total amount of attenuation switched in is the actual 'DB down' value of harmonic distortion. This value should be more than 30 DB down (26 DB - 121-CFA).

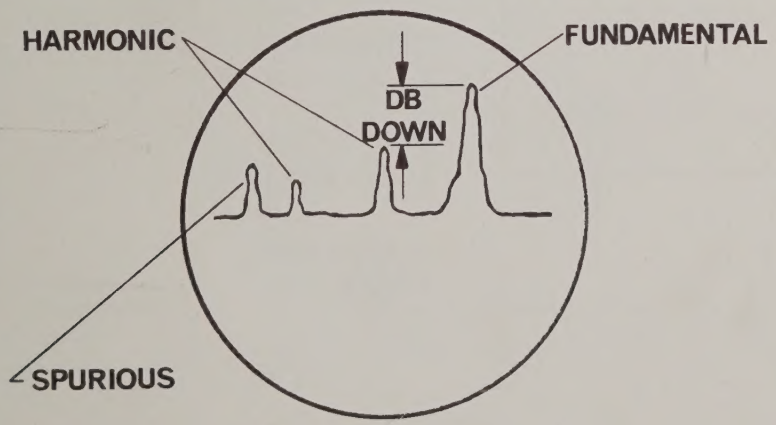


FIGURE 4-5

6. Connect the 100 MC Detector and repeat steps 3-5.

7. Connect the 300 MC Detector and repeat steps 3-5.

G. Harmonic Markers (optional with 121-C units)

Interconnect equipment as in Fig. 4-1.

Preliminary Settings:

Set controls as in Step (C1) except:

UHF-VHF switch - set to band in use
UHF CENTER FREQUENCY control - set to the center frequency
VHF CENTER FREQUENCY control - of band in use.
SWEEP WIDTH control - fully clockwise

1. Set HARMONIC MARKERS switch to 1, 10, or 100 MC position, depending on band in use. Markers should appear at the fundamental frequency plus every multiple of the fundamental.

2. 121-CFA units - using Band #1, set the HARMONIC MARKERS switch to the 63.0 or the 62.1 - 63.9 MC position; single frequency markers should appear at these frequencies.

H. External Detector Check

1. Connect equipment as shown in Fig. 4-6.

2. With controls set to provide 0-100 MC sweep, detected output should be approx. 0.2 V. peak.

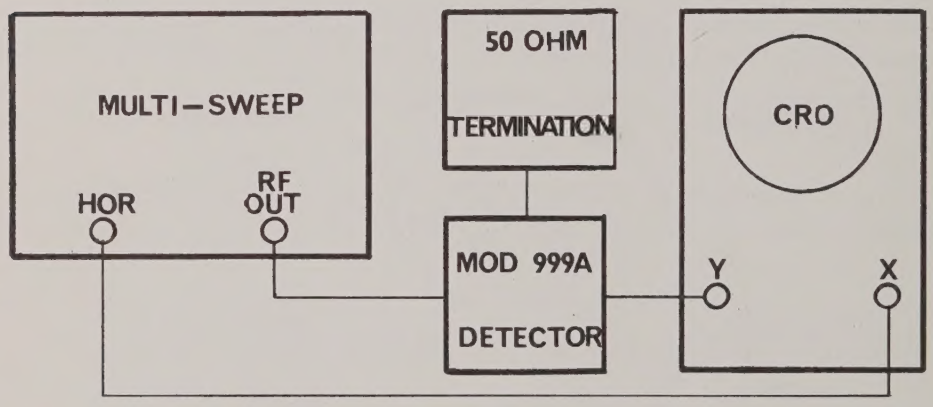


FIGURE 4-6

I. Blanking Check

1. Depress the BLANKING switch and note that the zero retrace line disappears and the output remains constant.

P-123
SWEPT-OCTAVE
PLUG-IN UNIT

The P-123 is an octave-sweeping VHF-UHF sweep generator plug-in unit which has been designed for use with the MULTI-SWEEP 121-C basic rack unit. The swept-octave output, 200-400 MC, 400-800 MC, 500-1000 MC, etc. is held constant by a fast-acting AGC circuit, which provides excellent wave shape and is completely free of spurious products.

The P-123 covers its selected octave in one continuously tunable range with a direct-reading frequency-calibrated dial. Similar to the P-121 and P-122 heads, this plug-in also works in conjunction with the 121-C's harmonic marking system.

SPECIFICATIONS

Frequency Range: Customer specified octave in the 100-1000 MC range.
Sweep Width: 0.2% to octave.
Frequency Linearity: 1.1 to 1.
RF Output: 0.5 volts into 50Ω.
Flatness: ± 0.5 DB over the widest sweep.